What is claimed is:

1   1. A gateway comprising:

2   a switching circuit;

3   a digital TV satellite receiver having an input for coupling to a satellite dish

4   and an output for coupling to said switching circuit;

5   an infrared or radio frequency receiver circuit for receiving commands and

6   data from a wireless remote and coupled to said switching circuit;

7   a conventional modem coupled to said switching circuit and having a port for

8   coupling to a conventional telephone line;

9   a decompression and conversion circuit having a digital data input coupled to

10   said switching circuit and having video and audio analog signal output ports and

11   functioning to decompress digital video and audio data supplied by said switching

12   circuit and convert said decompressed data into analog NTSC, PAL or SECAM video

13   signals and audio signals at said video and audio analog signal output ports and to

14   receive uncompressed IP packet data from said modem or said receiver and convert it

15   to video and/or audio analog signals at said video and audio output ports,

16   respectively;

17   a hard disk coupled to said switching circuit; and

18   a computer coupled to control signal inputs of said switching circuit and

19   coupled to send data to and receive data from said switching circuit, and programmed

20   to control said switching circuit in accordance with commands received from a

21   wireless remote control via said receiver circuit to make the proper connections to

22   record digital video broadcast data on said hard disk and/or convert said digital video

23   broadcast data into analog video and audio signals to drive said video and audio output

24   ports for coupling to a conventional television or to supply IP packet data from said

25   modem or receiver to said decompression and conversion circuit for conversion to

26   video and/or audio signals at said video and audio output ports.

1   2. The apparatus of claim 1 wherein said gateway includes an MP3 server therein.

1　　3. A gateway that implements TIVO-like functions comprising:

2　　　　　　a switching circuit;

3　　　　　　a digital TV satellite receiver having an input for coupling to a satellite dish

4　and an output for coupling to said switching circuit;

5　　　　　　an infrared or radio frequency receiver circuit for receiving commands and

6　data from a wireless remote and coupled to said switching circuit including

7　commands to carry out one or more TIVO functions;

8　　　　　　a conventional modem coupled to said switching circuit and having a port for

9　coupling to a conventional telephone line;

10　　　　　　a decompression and conversion circuit having a digital data input coupled to

11　said switching circuit and having video and audio analog signal output ports and

12　functioning to decompress digital video and audio data supplied by said switching

13　circuit and convert said decompressed data into analog NTSC, PAL or SECAM video

14　signals and audio signals at said video and audio analog signal output ports and to

15　receive uncompressed IP packet data from said modem or said receiver and convert it

16　to video and/or audio analog signals at said video and audio output ports,

17　respectively;

18　　　　　　a hard disk coupled to said switching circuit; and

19　　　　　　a computer coupled to control signal inputs of said switching circuit and

20　coupled to send data to and receive data from said switching circuit, and programmed

21　to control said switching circuit in accordance with commands received from a

22　wireless remote control via said receiver circuit to make the proper connections to

23　record digital video broadcast data on said hard disk and/or convert said digital video

24　broadcast data into analog video and audio signals to drive said video and audio output

25　ports for coupling to a conventional television or to supply IP packet data from said

26　modem or receiver to said decompression and conversion circuit for conversion to

27　video and/or audio signals at said video and audio output ports, said one or more

28　computer programs for controlling said computer to control said satellite receiver,

29　modem, switching circuit, hard disk and decompression and conversion circuitry to

30　download program guide data via said modem and to carry out one or more TIVO

31　functions requested via wireless commands received at said receiver from a wireless

32　remote control.

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1   4. A gateway that implements TIVO-like functions as well as interface one or more

2   peripherals to at least two different broadband digital data transmission mediums,

3   comprising:

4   a switching circuit;

5   a digital TV satellite receiver having an input for coupling to a satellite dish

6   and an output for coupling to said switching circuit;

7   an infrared or radio frequency receiver circuit for receiving commands and

8   data from a wireless remote and coupled to said switching circuit including

9   commands to carry out one or more TIVO functions;

10   a conventional modem coupled to said switching circuit and having a port for

11   coupling to a conventional telephone line;

12   a cable modem coupled to said switching circuit;

13   a network interface circuit or bus driver coupled to said switching circuit as

14   well as to a port for connection to a local area network or external bus;

15   rate shaping circuitry coupled to said switching circuit for altering the

16   bandwidth of data routed through said rate shaping circuitry;

17   a decompression and conversion circuit having a digital data input coupled to

18   said switching circuit and having video and audio analog signal output ports and

19   functioning to decompress digital video and audio data supplied by said switching

20   circuit and convert said decompressed data into analog NTSC, PAL or SECAM video

21   signals and audio signals at said video and audio analog signal output ports and to

22   receive uncompressed IP packet data from said modem or said receiver and convert it

23   to video and/or audio analog signals at said video and audio output ports,

24   respectively;

25   a hard disk coupled to said switching circuit; and

26   a computer coupled to control signal inputs of said switching circuit and

27   coupled to send data to and receive data from said switching circuit, and programmed

28   to control said switching circuit in accordance with commands received from a

29   wireless remote control via said receiver circuit to make the proper connections to

30   record digital video broadcast data on said hard disk and/or convert said digital video

31   broadcast data into analog video and audio signals to drive said video and audio output

32 ports for coupling to a conventional television or to supply IP packet data from said
33 conventional modem or receiver to said decompression and conversion circuit for
34 conversion to video and/or audio signals at said video and audio output ports, said one
35 or more computer programs for controlling said computer to control said satellite
36 receiver, modem, switching circuit, hard disk and decompression and conversion
37 circuitry to download program guide data via said modem and to carry out one or
38 more TIVO functions requested via wireless commands received at said receiver from
39 a wireless remote control, and/or to control said switching circuit to supply IP or
40 MPEG format packet data from said cable modem to said network interface circuit or
41 bus driver for output to one or more peripherals or to said decompression and
42 conversion circuit for conversion to analog video and/or audio signals at said video
43 and audio output port for display on a conventional television, and programmed to
44 control said switch to route selected data through said rate shaping circuitry and to
45 control said rate shaping circuitry to alter the bandwidth of data routed
46 therethrough.

1   5. A gateway that implements TIVO-like functions as well as interface one or more
2 peripherals to at least two different broadband digital data transmission mediums,
3 comprising:
4   a switching circuit;
5   a digital TV satellite receiver having an input for coupling to a satellite dish
6 and an output for coupling to said switching circuit;
7   an infrared or radio frequency transceiver circuit for exchanging commands
8 and data with a wireless remote and coupled to said switching circuit said exchanging
9 of commands and data including exchanging of commands and data to carry out one or
10 more TIVO functions and to display video images on said wireless remote;
11   a conventional modem coupled to said switching circuit and having a port for
12 coupling to a conventional telephone line;
13   high bandwidth digital data communication means coupled to said switching
14 circuit for exchanging data digitally at high data rate between said gateway and a
15 headend;

16   a network interface circuit or bus driver coupled to said switching circuit as

17   well as to a port for connection to a local area network or external bus;

18   a decompression and conversion circuit having a digital data input coupled to

19   said switching circuit and having video and audio analog signal output ports and

20   functioning to decompress digital video and audio data supplied by said switching

21   circuit and convert said decompressed data into analog NTSC, PAL or SECAM video

22   signals and audio signals at said video and audio analog signal output ports and to

23   receive uncompressed IP packet data from said modem or said receiver and convert it

24   to video and/or audio analog signals at said video and audio output ports,

25   respectively;

26   a hard disk coupled to said switching circuit; and

27   a computer coupled to control signal inputs of said switching circuit and

28   coupled to send data to and receive data from said switching circuit, and programmed

29   by one or more computer programs to control said switching circuit in accordance

30   with commands received from a wireless remote control via said transceiver circuit

31   to make the proper connections to record one or more programs encoded in digital

32   video broadcast data on said hard disk either simultaneously or by timed recording in

33   the future, and/or programmed to convert said digital video broadcast data into

34   analog video and audio signals to drive said video and audio output ports for coupling

35   to a conventional television, and programmed to control said switching circuit to

36   supply IP packet data from said conventional modem or transceiver to said high

37   bandwidth digital data communication means for transmission to a headend circuit to,

38   *inter alia,* request video programs, play games, etc., said one or more computer

39   programs for controlling said computer to control said satellite receiver,

40   conventional modem and/or high bandwidth digital data communication means, said

41   switching circuit, hard disk and decompression and conversion circuitry to

42   implement TIVO functions in said gateway by downloading program guide data via said

43   conventional modem or said high bandwidth digital data communication means and to

44   carry out one or more other TIVO functions requested via wireless commands

45   received at said receiver from a wireless remote control, and/or to control said

46   switching circuit to supply IP or MPEG packet data from said high bandwidth digital

47   data communication means or said satellite receiver or said conventional modem to

48   said network interface circuit or bus transceiver for output to one or more

49   peripherals coupled to said gateway via a local area network or external bus, or to

50   supply said IP or MPEG packet data to said decompression and conversion circuit for

51   conversion to analog video and/or audio signals at said video and audio output port for

52   display on a conventional television, and programmed to control said switch to route

53   selected data through said rate shaping circuitry and to control said rate shaping

54   circuitry to alter the bandwidth of data routed therethrough to match the available

55   bandwidth of whatever data path on which said data is to be transmitted.

1   6. The apparatus of claim 5 further comprising an MP3 server coupled to said

2 switching circuit and controlled by said computer to supply MP3 data to said network

3 interface circuit or bus transceiver for output to one or more peripherals coupled to said

4 gateway via a local area network or external bus.

1   7. A gateway that implements TIVO-like functions as well as interface one or more

2 peripherals to at least one broadband digital data transmission mediums, comprising:

3   one or more transceiver means for sending data to and receiving compressed

4   video and/or iData from a headend via one or more broadband, digital data

5   transmission mediums,

6   one or more processing means coupled to said one or more transciever means,

7   for performing MPEG transport demultiplexing, video decoding, MPEG encoding,

8   conditional access and decryption and rate shaping functions as necessary depending

9   upon the particular one or more types of transceiver means in use to generate digital

10   video and iData from a headend having a data rate suitable for transmission over a

11   local area network to the peripheral that requested said data and ready for

12   packetization, and for at least rate shaping data to be transmitted to said headend

13   prior to sending said data so said transceiver means such that said data has a data rate

14   compatible with available upstream bandwidth to said headend awarded to said

15   gateway;

16   one or more IP video means for encapsulating said video and iData from said

17   headend received from said processing means into IP packets;

18   a packet switch/router for receiving data from said IP video means and

19   routing said packets based upon data in routing tables to an appropriate destination

20   and for receiving data packets addressed to said headend and routing said packets to

21   said headend via using said processing means and said transceiver means;

22   a TIVO server means coupled to said packet switch/router for receiving

23   commands requesting one or more TIVO functions and for implementing said TIVO

24   functions by sending the appropriate menu or video data to said router for

25   appropriate routing;

26   a DHCP server means coupled to said router for assigning IP addresses to

27   client processes in said peripherals and said gateway;

28   a computer coupled to said router and programmed to receive commands and

29   requests from peripherals coupled to said gateway and from said headend and to write

30   data to said routing tables to control routing operations by said packet switch/router

31   to cause requested data and commands to get to the appropriate destination;

32   one or more local area network interface circuits (LAN NIC) permanently or

33   modularly coupled to said router for sending data received from said router to an

34   appropriate peripheral coupled to said local area network interface circuit by a local

35   area network transmission medium, and for receiving data and/or commands from a

36   peripheral addressed to said TIVO server or a process at said headend and for passing

37   said data and commands to said router for routing to the appropriate destination.

1   8. The apparatus of claim 7 further comprising a digital video disk player means

2   coupled to said router for supplying video data stored on a DVD to said router for routing to

3   said processing means, and wherein said processing means compresses said video data and

4   supplies compressed data to said IP video means and wherein said IP video means

5   encapsulates said compressed data into IP packets addressed to a peripheral that requested

6   said DVD data and encapsulates said IP packets into LAN packets of the type used by said

7   packet switch/router means addressed to the appropriate one or more of said LAN NIC

8   coupled to the peripheral that requested said DVD data, and wherein said packet

9   switch/router means routes said LAN packets to the appropriate LAN NIC for transmission

10   over a local area network to the peripheral that requested said DVD data.

1   9. The apparatus of claim 7 wherein said computer is programmed by an e-mail

2   application which controls said computer to receive email using a conventional modem or

3   one of said transceiver means and a television and settop decoder coupled to one of said local

4   area network interface circuits via a local area network for display of received e-mail and

5   message composition schemes and to send e-mail using said television and settop decoder

6   coupled to one of said local area network interface circuits via a local area network for

7   displaying a message composition scheme and a wireless remote or wireless keyboard

8   coupled to said gateway for entry of characters to be sent.

1   10. The apparatus of claim 7 wherein said gateway computer is programmed by a

2   PBX application so as to provide voicemail capability and PBX functionality such that

3   incoming calls from the public service telephone network can be routed to the telephone of

4   the individual the caller is calling via a PSTN interface circuit, said packet switch/router,

5   said computer, said local area network interface circuits and one or more local area

6   networks and LAN adapters, or routed to a voicemail file stored on a hard disk coupled to said

7   computer, said PBX application also controlling said computer so that outgoing calls can be

8   made from conventional telephones coupled to said gateway via one or more local area

9   networks and LAN adapters using said packet switch/router and a PSTN interface circuit.

1   11. The apparatus of claim 7 wherein said computer is further programmed by a

2   PBX application so as to provide voicemail capability and PBX functionality such that

3   incoming calls from the public service telephone network can be routed to the telephone of

4   the individual the caller is calling via a PSTN interface circuit, said packet switch/router,

5   said computer, one or more conventional tip and ring pairs and an interface circuit, or

6   routed to a voicemail file stored on an area of a hard disk of said TIVO server means reserved

7   for voicemail messages, said PBX application also controlling said computer so that outgoing

8   calls can be made from conventional telephones coupled to said gateway via one or more

9   conventional tip and ring pairs and an interface circuit using said packet switch/router and

1 0   a PSTN interface circuit.

1   12. The apparatus of claim 7 wherein said computer is further programmed with an

2   HTTP web server program for controlling said computer to serve web pages to browsers

3   browsing the internet via said packet switch/router and an interface means for interfacing

4   to the internet to provide an always on connection to the internet.

1   13. The apparatus of claim 7 wherein said computer is further programmed with an

2   answering machine program to control said computer to record messages for unanswered

3   incoming telephone calls from a public service telephone network interface or a voice-

4   over-IP channels.

1   14. The apparatus of claim 7 wherein further comprising a display coupled to a

2   display adapter which is coupled to said packet switch/router and further comprising a

3   keyboard or other input device coupled to an interface circuit which is coupled to said packet

4   switch/router, said keyboard and display for controlling said gateway by issuing commands

5   to said computer and displaying user interface data and/or command and/or program icons

6   on said display, and wherein said packet switch/router and said local area network interface

7   cards cooperate to allow any peripheral coupled by a LAN to any local area network interface

8   card to communicate with any other peripheral coupled by a LAN to a different local area

9   network interface card through said packet switch/router.